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|--|-------------|----------------------|---------------------------|------------------------|
| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.       | CONFIRMATION NO.       |
| 10/687,460   | 10/15/2003  | Tetsuo Hironaka      | SUSU121842                | 8870                   |
| 26389 7590 06/13/2007<br>CHRISTENSEN, O'CONNOR, JOHNSON, KINDNESS, PLLC<br>1420 FIFTH AVENUE<br>SUITE 2800<br>SEATTLE, WA 98101-2347 |             |                      | EXAMINER<br>SONG, JASMINE |                        |
|  |             |                      | ART UNIT<br>2188          | PAPER NUMBER           |
|  |             |                      | MAIL DATE<br>06/13/2007   | DELIVERY MODE<br>PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

|                              |                               |                                 |  |
|------------------------------|-------------------------------|---------------------------------|--|
| <b>Office Action Summary</b> | Application No.<br>10/687,460 | Applicant(s)<br>HIRONAKA ET AL. |  |
|                              | Examiner<br>Jasmine Song      | Art Unit<br>2188                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 16 is/are pending in the application.
- 4a) Of the above claim(s) 5-15 and 17 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16 is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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## **Detailed Action**

1. Claims 5-15 and 17 are withdrawn, and claims 1-4 and 16 are pending in the application. Thus, this Office action is in response to claims 1-4 and 16.

## **Specification**

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

## **Claim Rejections - 35 USC § 103**

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al., US 5,784,630

Regarding claim 1, Saito (first embodiment) teaches a multi-port instruction/data integrated cache (it is taught as the cache memory A5, col.7, lines 59-61) which is provided between a parallel processor to execute a plurality of types of processing in one clock cycle (col.8, lines 9-12) and a main memory (main memory A4) and which

stores a part of instructions and data stored in the main memory (Fig.1 and col.7, lines 57-59), comprising:

a plurality of ports (col.10, lines 22-24) including an instruction port unit consisting of at least one instruction port used to access an instruction from the parallel processor (Fig.5, col.15, lines 50-52), and a data port unit consisting of at least one data port used to access data from the parallel processor (Fig.5, col.15, lines 52-53), the data port and the instruction ports are connected individually to at least one predetermined memory bank (data and instructions must connected to the memory bank in order to read or write data from or to the memory bank), wherein a number of memory banks connected to the data port is larger than a number of memory banks connected to the instruction ports (col.15, lines 38-44), wherein a data width specified between the memory bank and the instruction port is larger than a data width specified between the bank and the data port (col.15, lines 38-44 and lines 56-59).

The first embodiment of Saito does not clearly teach a cache memory having a plurality of banks;

However, the secondary embodiment of Saito teaches a cache memory is divided into a plurality of cache banks (col.6, lines 16-18 and col.31, line 1-17 and col.32, lines 59-61).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of the second embodiment of Saito into the first embodiment of Saito such as a cache memory having a plurality of banks because the individual processors can simultaneously access the cache banks independent of

one another, thus, even when a large amount of data is shared by the individual processor elements, the cache hit ratio can be increased to thereby allow the individual processor elements to execute respective processing in parallel (col.6, lines 21-27).

Regarding claim 2, Saito teaches a plurality of non-continuous memory banks can be accessed from the instruction port, and all the memory banks can be accessed from the data port (col.4, lines 54 to col.5, lines 18).

Regarding claim 3, Saito teaches the multi-port instruction/data integrated cache is constituted by a hierarchical multi-port memory architecture structure (Fig.26).

Regarding claim 4, Saito teaches the multi-port instruction/data integrated cache is constituted by a crossbar switch network structure (Fig.26).

### **Allowable Subject Matter**

5. Claim 16 is allowed.

6. When responding to the office action, Applicant is advised to clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. He or she must also show how the amendments avoid such references or objections. See 37 C.F.R. 1.111 (c).

7. When responding to the office action, Applicants are advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist examiner to locate the appropriate paragraphs.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jasmine Song whose telephone number is 571-272-4213. The examiner can normally be reached on 7:30-5:30 (first Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung Sough can be reached on 571-272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

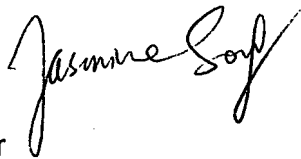
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Jasmine Song

A handwritten signature in cursive script that reads "Jasmine Song". The signature is written in black ink and is positioned to the right of the printed name "Jasmine Song".

Patent Examiner

June 11, 2007